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ABSTRACT

The Differential Ability Scales (DAS) was created to provide practitioners with an alternative instrument that may be as effective as WISC-III in picking up specific patterns of learning difficulties. Useful features and differences in the administration strategy of DAS are reviewed. DAS provides extended age ranges and out-of-level testing, improving its usefulness for students from a non-normal sample. Scoring is reviewed. The differences of outcomes on the DAS and WISC-III are investigated in a sample of children receiving LD services (N=26). Descriptive statistics are reviewed for the sample. Comparisons are made between DAS General Conceptual Ability (GCA) (total cognitive score) and WISC-III Full Scale IQ (FSIQ). Analyses of correlations between WISC-III IQ's and DAS cluster scores are presented. Intercorrelations are presented for Verbal IQ (VIQ), Performance IQ (PIQ) and Full Scale IQ (FIQ) of the WISC-III; and for Verbal Comprehension, Non-verbal, Spatial, and GCA scores of the DAS. Differences between mean scores of WISC-III IQ's and DAS cluster scores, and correlations between significant differences for individuals are presented. Evidence of concurrent validity is presented. Findings support the usefulness of this test with an LD population. Implications of these findings are discussed in the context of educational assessment and clinical use. (EMK)

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# A Comparison of DAS and WISC-III Scores for Children with Disabilities

Paper presented at the annual meeting of the National Association of School Psychologists

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Over the past several years a new test, the Differential Ability Scales (DAS) has been introduced to the field. It is unique to other cognitive measures in that the General Conceptual Ability (GCA) score (Composite score) incorporates only subtests that are salient measures of "g" having been found to have substantial loadings on that factor (Elliott, 1990, Stone, 1992).

The total cognitive score or GCA is a composite of Verbal, Nonverbal, and Spatial cluster scores, which are each made up of two subtests. The Verbal subtests are similar to those on the WISC-III, measuring vocabulary knowledge and the ability to infer relationships between words. The Nonverbal Reasoning subtests measure sequential reasoning, nonverbal inductive reasoning, visual discrimination, and the ability to develop and test hypotheses. The Spatial subtests, separated out from the general Nonverbal cluster, measure visual motor skills, short-term visual memory and the ability to analyze and synthesize information.

The DAS has been created to provide practitioners with an alternative instrument that may be as effective as the WISC-III in picking up specific patterns of learning difficulties. In support of its utility over the WISC-III, the DAS provides extended age ranges for all of its subtests on all levels, making it possible to collect more information on a child in a given area not included in that child's core battery. The DAS also provides out of level testing. This allows the examiner to administer items from a different age range to a particular child and provides adjusted GCA norms for scoring (Elliott, 1990).

Aside from the flexibility of the DAS, there are features that prove useful to practitioners when assessing children with special needs. For one, there are fewer timed subtests than on the WISC-III; totally untimed versions of the DAS also are available, giving the opportunity for children who process information more slowly to experience success. There are also fewer verbal instructions which means that its administration moves along at a more active pace. This is an advantage for children with a different native language or for others who have trouble listening for long periods of time, particularly common in the elementary years. The DAS also allows the clinician to teach the task more often, offering the child further opportunities for success. Finally, the DAS is well-normed for children with motor impairments and/or speech and communication difficulties.

Despite all of the potential benefits that the DAS has to bring to the field of school psychology, there is still hesitation to utilize it by both practitioners and researchers alike. This hesitation is linked to the most exciting attribute of the DAS; its uniqueness to other intelligence tests currently available. It is a different test, with different scores from the WISC-III. Thus far, comparison studies have focused exclusively on the likeness of DAS scores to those of the WISC-R a tool with a standardization sample 22 years old. Accumulated research has found between two to five point differences on the two instruments when sampling normal children. Further research with learning disabled students found a slightly greater difference of 6.5 points.

Given the revision of the WISC-R, differences between the WISC-III and DAS scores in exceptional populations is unknown. In order to support the DAS as a useful tool for practitioners and clinicians today, a correlational study utilizing the WISC-III itself is necessary.

The purpose of this study is to investigate the differences of outcomes on the DAS and WISC-III in a sample of children receiving LD services. More specifically, comparisons will be made between DAS GCA and WISC-III FSIQ. Furthermore, the Verbal, Nonverbal and Spatial cluster scores on the DAS will be compared to WISC-III VIQ and PIQ. Data will be examined for evidence of concurrent validity. Implications of these findings are discussed in the context of educational assessment and clinical use.

## Method

The participants in this study included 26 children from an urban school division in southeastern Virginia who were identified as LD. All participants were evaluated as part of a regular triennial review. The mean age of the sample was 10.71 years, and ranged from grades 1 -6. All children were given the standard 10 subtests from the WISC-III and the School Age Core of the DAS. These instruments were given in counterbalanced order, so half of the sample received the DAS first, and half of the sample received the WISC-III first. Examiners conducting the assessments were experienced in the individual administration of ability tests. Determination of LD status was made by a multidisciplinary based on established criteria that are consistent with state and federal regulations.

The Verbal IQ (VIQ), Performance IQ (PIQ) and Full Scale IQ (FIQ) from the WISC-III were correlated with the Verbal Comprehension Cluster (VC), Nonverbal Cluster (NV), Spatial Cluster (SP) and General Conceptual Ability score (GCA) from the DAS in order to establish the concurrent validity of the DAS for an LD sample. Additionally, comparisons were made between mean scores of the instruments, and the degree to which significant discrepancies between subscales of the WISC-III corresponded with significant discrepancies between the clusters of the DAS was investigated.

## Results

Descriptive statistics indicated that mean IQ's for the sample generally fell in the low average range. These lower scores are consistent with previous research using exceptional samples. Observed standard deviations were slightly higher than the expected value of 15, especially for the VC cluster of the DAS where the standard deviation reached over 20 points. The standard deviation for the NV cluster of the DAS was lower than the expected value of 15, indicating a possible restriction of range with this sample. Additionally, the mean for the NV cluster was significantly lower than the other scores. Table 1 presents the means and standard deviations for the WISC-III IQ's and DAS cluster scores.

Dependent t-tests were used to examine mean differences between WISC-III IQ's and DAS cluster scores. Significant differences were found between all WISC-III IQ's and the NV cluster of the DAS ($p < .002$), with the NV cluster always being the lower score. Significant differences were also

found between all WISC-III IQ's and GCA of the DAS ($p < .05$), with the GCA always being the lower score.

Correlations between the WISC-III IQ's and DAS cluster scores were calculated and are presented in Table 2. All correlations were significant ($p < .002$). The largest observed correlation of .91 was between FIQ and GCA, indicating an 83% overlap between these two scores. The lowest correlation of .58 was between VIQ and SP. The correlations between the WISC-III and DAS for this sample of LD children were consistent with those reported in the WISC-III manual (Wechsler, 1991) for a sample of 27 children in the standardization group. Additionally, there were no significant differences between the correlations found in this study and those reported in the WISC-III manual (Wechsler, 1991) from a sample of 32 children with Attention Deficit Hyperactivity Disorder and LD.

Correlations within the IQ's of the WISC-III and cluster scores of the DAS were calculated so that comparisons could be made to the results reported in the manuals of these instruments. Table 3 presents the intercorrelations for the WISC-III scores. All of the correlations were significant ($p < .001$) and did not significantly differ from those reported in the WISC-III manual across all ages (Wechsler, 1991). Table 4 presents the intercorrelations for the DAS cluster scores and GCA. All of the correlations were significant ($p < .01$). There were no significant differences between the correlations from this study and those reported in the DAS manual (Elliott, 1990) across all ages.

Finally, the correspondence between significant VIQ/PIQ discrepancies and VC/NV, VC/SP and SP/NV cluster discrepancies was examined. Dummy variables were created to indicate whether a significant difference was present or absent. Significant differences for each pair were coded as 1 for a significant difference present and 0 for a significant difference absent. A 12 point difference between VIQ and PIQ for the WISC-III was considered significant, and a 16 point difference between the DAS clusters was considered significant. These values are consistent with those recommended in the technical manuals for each instrument. The dummy variables then were correlated. Table 6 presents the correlations between significant differences for individuals. There was no significant overlap between difference scores.

Table 1
Means and Standard Deviations of WISC-III IQ's and DAS clusters for the sample

| SUBSCALE | MEAN | STANDARD DEVIATION |
|---|---|---|
| VIQ | 88.81 | 16.37 |
| PIQ | 92.19 | 16.76 |
| FIQ | 89.42 | 16.56 |
| VC | 90.69 | 20.35 |
| NV | 80.73 | 13.64 |
| SP | 90.62 | 17.61 |
| GCA | 85.54 | 15.68 |

Table 2
Correlations between WISC-III IQ's and DAS cluster scores

| | VC | NV | SP | GCA |
|---|---|---|---|---|
| VIQ | .90 | .68 | .56 | .88 |
| PIQ | .63 | .62 | .76 | .80 |
| FIQ | .83 | .71 | .73 | .91 |

Note. All correlations are significant ($p < .002$).

Table 3
Intercorrelations between VIQ, PIQ and FIQ of the WISC-III

| | VIQ | PIQ | FIQ |
|---|---|---|---|
| VIQ | 1.000 | .7205 | .9337 |
| PIQ | | 1.000 | .9204 |
| FIQ | | | 1.000 |

Table 4
Intercorrelations between Verbal Comprehension, Non-verbal, Spatial, and GCA scores of the DAS

| | VC | NV | SP | GCA |
|---|---|---|---|---|
| VC | 1.000 | .7405 | .4002 | .8785 |
| NV | | 1.000 | .4333 | .8510 |
| SP | | | 1.000 | .7293 |
| GCA | | | | 1.000 |

Table 5
Differences between mean scores of WISC-III IQ's and DAS cluster scores

| | VC | NV | SP | GCA |
|---|---|---|---|---|
| VIQ | -1.89 | 8.08* | -1.81 | 3.27* |
| PIQ | 1.50 | 11.46* | 1.58 | 6.65* |
| FIQ | -1.27 | 8.69* | 1.19 | 3.89* |

Note. Values in table cells represent row minus column means.
* indicates significant difference between mean scores

Table 6
Correlations between significant differences for individuals

| | VC - NV | VC - SP | SP - NV |
|---|---|---|---|
| VIQ - PIQ | -.21 | .05 | .30 |

Note. Significant differences for each pair were coded as 1 for a significant difference present and 0 for a significant difference absent.

Discussion Points

- Correlations between WISC-III and DAS for a sample of LD children were significant and consistent with those reported in the WISC-III manual for a subset of the standardization sample and an LD sample. Data supports the concurrent validity of the DAS with an exceptional group of children. Clinicians can expect consistent performance across instruments.

- Mean score differences between the WISC-III IQ's and DAS cluster scores were similar with the exception of the NV cluster of the DAS which was significantly lower than all of the WISC-III IQ's. From a clinical perspective the difference of 8 points between VIQ and NV and FIQ and NV is substantial. The 12 point difference between PIQ and NV and the consistency of PIQ and SP is of particular interest since all of these subscales fall into the nonverbal domain. It appears that the NV cluster is measuring something unique. Examination of the subtests that make up the NV cluster reveal a heavier reliance on the identification of rules and hypothesis testing with more abstract problems than the PIQ or SP subtests. The NV cluster may be an advantage of the DAS in assessing LD students, especially those with difficulties in nonverbal processes. The overlap between the NV and SP clusters in factor analytic studies has raised some concerns about the distinction between these areas. The results of this study indicated that the NV and SP clusters correlated significantly, however their mean scores significantly differed. This provides further support that the NV cluster is measuring something distinct with LD students. Another possible explanation for the lower NV score is its sensitivity to impulsivity and guessing. It was observed that as children became fatigued they were more prone to random responses.

- Significant differences also were found between the GCA and the three WISC-III IQ's. This finding is likely a result of the significantly lower scores on the NV cluster which served to pull down the GCA which is based on all three clusters. Furthermore, the magnitude of the differences between GCA and the WISC-III IQ's is much smaller. For the VIQ and FIQ, the difference from the GCA is only 3.27 and 3.89 points, respectively which is close to the standard error of measurement for the instruments.

- There was no correlation between significant discrepancies for WISC-III IQ's and DAS cluster scores. In other words an individual with a significant discrepancy of at least 12 points between VIQ and PIQ was not any more likely to show a significant cluster difference of at least 16 points on the DAS than someone without a VIQ/PIQ discrepancy. Considering the correlations between the instruments, it seems that the scores overlap but the discrepancies between subscales/clusters do not overlap.

- The primary limitation of this study was the small sample size which restricts generalization of results. However, the results of this study are comparable to those cited in the WISC-III manual in

which similar sample sizes were utilized. Further research needs to replicate this study with a larger sample and investigate the correlations between instruments across various age levels.

## Summary

The results provide support for the concurrent validity of the DAS for a LD sample. The significant correlations with the WISC-III suggest that the DAS is a suitable alternative to the WISC-III when assessing LD students. The findings of significantly different performance of the LD sample on the DAS NV cluster suggest that this cluster may be more sensitive to difficulties in non-verbal reasoning than the PIQ or SP cluster. The findings of this study in addition to the practical advantages of the DAS, including fewer verbal instructions, more opportunities to teach the tasks, reduced emphasis on speed and extended norms provides strong support for its use in assessment of LD students at the elementary level.